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Proceedings of the Regional Assessment of Northern Shrimp (*Pandalus borealis*) of the Eastern Scotian Shelf (SFAs 13-15)

November 27, 2014
Dartmouth, Nova Scotia

Chairperson and editor: Kristian Curran

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Fisheries and Oceans Canada
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Canada

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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Aussi disponible en français :

MPO. 2015. Compte rendu de l'évaluation régionale de la crevette nordique (Pandalus borealis) de l'est du plateau néo-écossais (ZPC 13 à 15) ; le 27 novembre 2014. Secr. can. de consult. sci. du MPO, Compte rendu 2015/030.

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SUMMARY

The biology of northern shrimp, *Pandalus borealis*, of the Eastern Scotian Shelf stock has been well-documented. Although there has been some shrimp fishing on the Scotian Shelf since the 1960s, the Nova Scotia fishery began to expand toward its full potential only when groundfish bycatch restrictions were overcome with the introduction of the Nordmøre grate in 1991. In the past, science advice for the stock has been provided on an annual basis, with full peer review and industry participation occurring until 2012. Commencing in 2013, the fishery is to be fully assessed every two years, with interim advice provided in interim years. The first interim advice was provided in 2013 based on a complete analysis of the data (DFO 2014). On November 27, 2014, an Eastern Scotian Shelf shrimp assessment science advisory meeting was held at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. The objectives of the meeting were to:

1) assess the overall status of Eastern Scotian Shelf shrimp (Shrimp Fishing Areas 13-15) as of the fall of 2014;
2) report on bycatch of non-shrimp species; and
3) evaluate the consequences of different harvest levels during the 2015 fishery.

Peer reviewers and meeting participants felt that the Working Paper presented sound scientific analyses based on the best available information on northern shrimp of the Eastern Scotian Shelf, and is acceptable for publication as a Research Document pending revision following discussions at the meeting. There was also support for the proposed Science Advisory Report provided edits discussed at the meeting were adopted within the final version of the report. The Science Advisory Report received consensus at the meeting. A framework assessment for northern shrimp of the Eastern Scotian Shelf is scheduled for April 14-15, 2015.

SOMMAIRE

The biology of northern shrimp, Pandalus borealis, of the Eastern Scotian Shelf stock has been well-documented. Although there has been some shrimp fishing on the Scotian Shelf since the 1960s, the Nova Scotia fishery began to expand toward its full potential only when groundfish bycatch restrictions were overcome with the introduction of the Nordmøre grate in 1991. In the past, science advice for the stock has been provided on an annual basis, with full peer review and industry participation occurring until 2012. Commencing in 2013, the fishery is to be fully assessed every two years, with interim advice provided in interim years. The first interim advice was provided in 2013 based on a complete analysis of the data (DFO 2014). On November 27, 2014, an Eastern Scotian Shelf shrimp assessment science advisory meeting was held at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. The objectives of the meeting were to:

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INTRODUCTION

The biology of northern shrimp, *Pandalus borealis*, of the Eastern Scotian Shelf stock has been well-documented. Although there has been some shrimp fishing on the Scotian Shelf since the 1960s, the Nova Scotia fishery began to expand toward its full potential only when groundfish bycatch restrictions were overcome with the introduction of the Nordmøre grate in 1991. The total allowable catch (TAC) was first reached in 1994 when individual Shrimp Fishing Area (SFAs) quotas were removed. Since 1994 the TAC has varied from 3000 to 5500 tonnes. The TAC has generally been higher during periods of high survey total and spawning stock biomass and when large year classes are known to be recruiting to the fishery, even though approximately 25 indicators are considered in the provision of science advice for the stock. The TAC has generally been reduced to maintain low exploitation rates when biomass indices and/or catch rates are decreasing, or are expected to decrease based on cohort tracking. In the past, science advice was provided on an annual basis, with full peer review and industry participation occurring until 2012. Commencing in 2013, the fishery is to be fully assessed every two years, with interim advice provided in interim years. The first interim advice was provided in 2013 based on a complete analysis of the data (DFO 2014), with this assessment being the first full assessment.

An Eastern Scotian Shelf shrimp assessment science advisory meeting was held November 27, 2014, at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. The meeting Chair-person, Mr. Kristian Curran, first introduced himself, followed by an introduction of meeting participants (Appendix 1). The Chair thanked meeting participants for attending the Fisheries and Oceans Canada (DFO) Science Advisory Process. The Chair noted that this was a science peer-review meeting in which a science advisory report would be completed. The overall objectives of the meeting were:

- Assess the overall status of Eastern Scotian Shelf shrimp (Shrimp Fishing Areas 13-15) as of the fall of 2014, including relative stock abundance and exploitation rate.
- Report on the bycatch of non-shrimp species in the 2014 fishery, including the abundance of bycatch species relative to the amount of shrimp caught in the fishery that year and any notable changes in their occurrence relative to previous years.
- Evaluate the consequences of different harvest levels during the 2015 fishery on stock abundance and exploitation rate.

The Chair provided a brief overview of the Canadian Science Advisory Secretariat (CSAS) science advisory process and invited participants to review the meeting Terms of Reference (Appendix 2) and Agenda (Appendix 3). No revisions or additions were made to the Terms of Reference or Agenda. To guide discussion, a Working Paper was provided to meeting participants on November 19, 2014, ahead of the meeting. A Science Advisory Report (SAR) was a product of the meeting. This Proceeding constitutes a record of the discussion of the meeting.

PRESENTATION AND DISCUSSION

REVIEW OF WORKING PAPER

Rapporteur: Kristian Curran

The shrimp science lead, Dr. David Hardie, reviewed the Working Paper. Discussion focused on various aspects of the document, including: methods of analysis/data sources; differences in survey abundance indices; and bycatch and other ecosystem considerations. In general, there were no major concerns expressed by peer reviewers or meeting participants regarding the 'traffic light' approach used for assessment. There was discussion regarding fixed station/random station treatment of data in one of the survey areas, and it was noted that the Working Paper needs to be more explicit that fixed stations are treated essentially the same as random stations for purposes of this particular analysis. In addition, it was noted that the Working Paper should also more clearly note that northern shrimp move off the seabed at night time, so trawl surveys were completed in the day time to account for this behaviour. Last, one meeting participant noted that they found the Traffic Light Summary difficult to follow, suggesting that it required a bit more explanation.

In terms of other elements of the Working Paper, it was suggested that the bycatch results be presented as relative values for comparison to bycatch information presented in other fisheries. There was discussion throughout the presentation regarding various sources of uncertainty that might influence various calculations and estimates presented in the Working Paper. Looking forward, it was recommended that additional exploratory 'modeling' be pursued prior to the next framework assessment meeting planned for April 2015. Similarly, a framework could explore the development of an egg production index with data on abundance, size structure, and fecundity at size. Last, a framework could also explore analyses on 'ecosystem habitat', which would be consistent with regional Ecosystem Approach to Management (EAM) framework. In general, the peer reviewers and meeting participants felt that the Working Paper was very thorough, scientifically sound, and well done.

REVIEW OF SCIENCE ADVISOR REPORT

Rapporteur: Kristian Curran

Meeting participants reviewed the SAR section-by-section. The primary focus of discussion was a divergence in the DFO-Industry Trawl survey index and Catch per Unit Effort (CPUE) indices observed in 2014. Although this divergence should continue to be monitored, the overall fishable biomass of northern shrimp on the Eastern Scotian Shelf is abundant. There was no opposition to the document, and only minor revisions were proposed by meeting participants. In general, meeting participants felt that the SAR was well-written and suitable for publication. The SAR received consensus at the meeting.

CONCLUSIONS

Meeting participants felt the Working Paper presented sound scientific analyses based on the best available information on northern shrimp of the Eastern Scotian Shelf, and is acceptable for publication as a Research Document pending revision following discussions at the meeting. There was support for the proposed SAR provided edits discussed at the meeting were adopted in the report's final format. Sincere efforts were made in this science peer review process to acknowledge and address all comments and concerns raised by meeting participants provided they were appropriate and within the confines of acceptable peer review practice. The SAR

received consensus at the meeting. A framework assessment for northern shrimp of the Eastern Scotian Shelf is planned for April 14-15, 2015.

REFERENCES CITED

DFO. 2014. Eastern Scotian Shelf Shrimp Stock Status Update for 2013-2014. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/012.

APPENDICES

APPENDIX 1: LIST OF MEETING PARTICIPANTS

Name	Affiliation
Kristian Curran	Centre for Science Advice / DFO Maritimes
David Hardie	Science / DFO Maritimes
Jessica Sameoto	Science / DFO Maritimes
John Tremblay	Science / DFO Maritimes
Michele Covey	Science / DFO Maritimes
Alida Bundy	Science / DFO Maritimes
Thomas Wheaton	Science / DFO Maritimes
Jennifer Ford	Resource Management / DFO Maritimes
Scott Coffen-Smout	Ecosystem Management / DFO Maritimes
Annie Ferguson (WebEx)	New Brunswick Agriculture, Aquaculture and Fisheries
Leon Denny	Eskasoni Fish and Wildlife Commission / Crane Cove Seafoods
Joshua McNeely	Maritimes Aboriginal Peoples Council / IKANAWTIKET
John Couture	Unama'ki Institute of Natural Resources
Ginny Boudreau	Guysborough Co. Inshore Fishermen's Association
Scott Conrod	Atlantic Canadian Mobile Shrimp Association
Michel Legere	Assn. des Crevettiers acadiens du Golfe Inc.
Eda Roussel	Assn. des Crevettiers acadiens du Golfe Inc.
Frank D'Entremont	Licence Holder
Peter Koeller	Independent

APPENDIX 2: MEETING TERMS OF REFERENCE

ASSESSMENT OF EASTERN SCOTIAN SHELF SHRIMP
Regional Peer Review – Maritimes Region

November 27, 2014
Dartmouth, NS

Chairperson: Kristian Curran

TERMS OF REFERENCE

Context

The status of Eastern Scotian Shelf shrimp was last assessed by DFO Science as an Update in December 2013 (DFO 2014). The last full assessment for the fishery was conducted in December 2012 (DFO 2013; Hardie et al. 2014). The current assessment is requested by DFO Fisheries and Aquaculture Management to provide harvest advice for 2015.

Objectives

- Assess the overall status of Eastern Scotian Shelf shrimp (Shrimp Fishing Areas 13-15) as of the fall of 2014, including relative stock abundance and exploitation rate.
- Report on the bycatch of non-shrimp species in the 2014 fishery, including the abundance of bycatch species relative to the amount of shrimp caught in the fishery that year and any notable changes in their occurrence relative to previous years.
- Evaluate the consequences of different harvest levels during the 2015 fishery on stock abundance and exploitation rate.

Expected Publications

- Science Advisory Report
- Proceedings
- Research Document

Participation

- Fisheries and Oceans Canada Science and Resource Management
- Province of Nova Scotia and Province of New Brunswick
- Aboriginal communities/organizations
- Fishing Industry

References

DFO. 2013. Assessment of Northern Shrimp on the Eastern Scotian Shelf (SFAs 13-15). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/073.

DFO. 2014. Eastern Scotian Shelf Shrimp Stock Status Update for 2013-2014. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/012.

Hardie, D., Covey, M., and King, M. 2014. Scotian Shelf Shrimp 2012-2013. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/034. v + 44 p.

APPENDIX 3: MEETING AGENDA

ASSESSMENT OF EASTERN SCOTIAN SHELF SHRIMP
Regional Peer Review – Maritimes Region

November 27, 2014
Dartmouth, NS

Chairperson: Kristian Curran

DRAFT AGENDA

November 27, 2014

09:00 - 09:15	Welcome and Introduction (Chair)
09:15 - 10:00	Review of Assessment
10:00 - 10:15	Break
10:15 - 12:00	Review of Assessment (cont'd)
12:00 - 13:00	Lunch
13:00 - 15:00	Review of Science Advisory Report
15:00 - 15:15	Break
15:15 - 17:00	Review of Science Advisory Report (cont'd)